



MATERIAL SAFETY DATA SHEET

NAME OF PRODUCT: 1,4 Benzoquinone MSDS DATE: 20 Sep, 2011

Notice

NSF Reference Standards are for test and assay use only and are not intended for human or animal consumption. This document communicates information relating to test and assay use only and may not be applicable for any unauthorized use.

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: 1,4 Benzoquinone
Catalog Code: RS1-0002
Synonym: para benzoquinone
Chemical Formula: $C_6H_4O_2$
CAS #: 106-51-4

Contact Information:

NSF International
789 N. Dixboro Road
Ann Arbor, MI 48113-0140, USA
Toll Free (USA): 800-NSF-MARK (800-673-6275)
Telephone: (+1) 734-769-8010
Fax: (+1) 734-769-0109
www.nsf-rs.org

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Name: 1,4 Benzoquinone

CAS#: 106-51-4

% by Weight: 100%

Toxicological Data on Ingredients:

1,4 Benzoquinone: ORAL (LD50): Acute: 130 mg/kg (Rat)

SECTION 3: HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Extremely Hazardous in case of skin contact (irritant), of eye contact (irritant), and of ingestion. Very hazardous in case of skin contact (permeator corrosive, irritator). Damage is dependent on exposure time. Eye contact can result in corneal damage or blindness. Skin contact can lead to irritation or



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blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over exposure can result in lung damage, choking, unconsciousness or death. Eye irritation is characterized by redness, watering, and itching. Skin irritation is characterized by itching, scaling, redness or possibly blistering.

Potential Chronic Health Effects:

Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), and of ingestion. Very hazardous in case of skin contact (permeator corrosive, irritator).

CARCINOGENIC EFFECTS: Not available

MUTAGENIC EFFECTS: Not available

TERATOGENIC EFFECTS: Not available

DEVELOPMENTAL TOXICITY: Not available

Repeated exposure to eyes to a low level of dust can produce irritation and reddening.

Repeated skin exposure can cause local skin destruction and/ or dermatitis.

Repeated inhalation can produce varying degrees of irritation or lung damage.

Repeated exposure generally can produce a general deterioration of health.

SECTION 4: FIRST AID MEASURES

Eye Contact:

Check for and remove contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Warm water should be used. Seek medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes and thoroughly wash before reuse. Seek medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing. Seek medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing. Seek medical attention immediately.



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Serious Ingestion: Not available.

SECTION 5: FIRE-FIGHTING MEASURES

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 560 °C

Flammable Limits: Not available.

Flash Points: CLOSED CUP: Higher than 77 °C

Products of Combustion: These products are carbon oxides (CO, CO₂).

Special Remarks on Explosion Hazards: Not available.

Fire Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

SECTION 7: HANDLING AND STORAGE

Precautions:

Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep product away from incompatible materials such as oxidizing agents.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area.



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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

If laboratory operations generate dust, fume or mist, use local exhaust ventilation or other appropriate engineering controls to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Synthetic apron. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: TWA: 0.1 CEIL: 2 Consult local authorities for acceptable exposure limits.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Pungent

Taste: Not available

Molecular Weight: 108.9 g/mol

Color: Yellow to dark yellow-green

pH (1% soln/water): Not available

Boiling Point: Decomposes.

Melting Point: 115.7 °C (240.3°F)

Critical Temperature: Not available

Specific Gravity: 1.318 (water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 3.7 (air = 1)

Volatility: Not available.

Odor Threshold: 0.1 ppm

Water/Oil Dist. Coeff.: Not available

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Partially soluble in hot, cold water, and acetone. Very slightly soluble in diethyl ether. Freely soluble in pyrrole; in tetrahydrofuran containing about 4% water. Soluble in pyridine, ethyl acetate. Partially



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soluble in alcohol and slightly soluble in petroleum ether. Solubility in water is increased by alkali benzoates, cinnamates, citrates or salicylates

SECTION 10: STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat

Incompatibility with various substances: Reactive with oxidizing agents

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Routes of Entry: Eye Contact, Dermal contact, Inhalation, Ingestion.

Toxicity to Animals: 1,4 Benzoquinone: ORAL (LD50): Acute: 130 mg/kg (Rat)

Chronic Effects on Humans:
Not available.

Other Toxic Effects on Humans: Extremely hazardous in case of ingestion. Very hazardous in case of skin contact (corrosive, irritant). Hazardous in case of skin contact (permeator), of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Not available

Special Remarks on Chronic Effects on Humans:
Not Available

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product



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itself.

Special Remarks on the Products of Biodegradation: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

DOT Classification: CLASS 6.1: Poisonous material.

Identification: Benzoquinone UNNA: UN2587 PG: II

Special Provisions for Transport: Not available.

SECTION 15: REGULATORY INFORMATION

Federal and State Regulations:

TSCA 8(b) inventory: Benzoquinone (para)

Pennsylvania RTK: Benzoquinone (para)

Massachusetts RTK: Benzoquinone (para)

SARA 313 toxic chemical notification and release reporting: Benzoquinone (para)

CERCLA: Hazardous substances: Benzoquinone (para)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). Other

Classifications:

WHMIS (Canada): Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).

Class D-2b: Material causing other toxic effects (TOXIC). Class E: Corrosive solid.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 2

Reactivity: 0

Personal Protection: J

National Fire Protection Association (U.S.A.):

Health: 3



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Flammability: 2
Reactivity: 0
Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Dust respirator. Be sure to use an approved/certified respirator or equivalent.
Splash goggles.

SECTION 16: OTHER INFORMATION

References: Not available.
Other Special Considerations: Not available.

DISCLAIMER:

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MATERIAL SAFETY DATA SHEET

NAME OF PRODUCT: Sucrose MSDS DATE: 18 July, 2011

Notice

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sucrose
Catalog Code: RS1-0006
Synonym: Sugar
Chemical Formula: $C_{12}H_{22}O_{11}$
CAS #: 57-50-1

Contact Information:

NSF International
789 N. Dixboro Road
Ann Arbor, MI 48113-0140, USA
Toll Free (USA): 800-NSF-MARK (800-673-6275)
Telephone: (+1) 734-769-8010
Fax: (+1) 734-769-0109
www.nsf-rs.org

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Name: Sucrose

CAS#: 57-50-1

% by Weight: 100%

Toxicological Data on Ingredients: Not Applicable

SECTION 3: HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Slightly hazardous in case of skin contact (irritant), or eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available



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MUTAGENIC EFFECTS: Mutagenic for bacteria/ yeasts

TERATOGENIC EFFECTS: Not available

DEVELOPMENTAL TOXICITY: Not available

SECTION 4: FIRST AID MEASURES

Eye Contact:

Check for and remove contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:

In case of contact, wash skin with soap and water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes and thoroughly wash before reuse. Get medical attention if irritation develops.

Serious Skin Contact:

Not available

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.

Serious Inhalation:

Not available.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing. Seek medical attention immediately.

Serious Ingestion: Not available.

SECTION 5: FIRE-FIGHTING MEASURES

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flammable Limits: Not available.

Flash Points: Closed Cup: Higher than 93.3 °C.

Products of Combustion: These products are carbon oxides (CO, CO₂)

Special Remarks on Explosion Hazards: Not available.



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Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Special Remarks on Fire Hazards: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional requirements.

Large Spill:

Use appropriate tools to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional requirements.

SECTION 7: HANDLING AND STORAGE

Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION



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Engineering Controls:

If laboratory operations generate dust, fume or mist, use local exhaust ventilation or other appropriate engineering controls to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 15 (mg/m³) from OSHA (PEL) (United States) Inhalation total/

TWA: 10 (mg/m³) from ACGIH (TLV) United States

TWA: 10 (mg/m³) from NIOSH Inhalation Total

TWA: 5 (mg/m³) From NIOSH inhalation Respirable.

TWA: 5 (mg/m³) From OSHA (PEL)

Consult local authorities for acceptable exposure limits.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Crystalline Solid.

Odor: Characteristic caramel to odorless

Taste: Sweet

Molecular Weight: 342.3 g/mol

Color: White

pH (1% soln/water): Not available

Boiling Point: Not available.

Melting Point: 186°C

Critical Temperature: Not available

Specific Gravity: 1.587

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Sucrose is more soluble in water; log (oil/water) = - 3.7



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Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Soluble in cold water.

SECTION 10: STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Not available

Special Remarks on Reactivity: Reactive with sulfuric acid, nitric acid, and oxidizers.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Routes of Entry: Ingestion, Inhalation

Toxicity to Animals: Acute oral toxicity (LD50): 29700 mg/kg [Rat].

Chronic Effects on Humans: Not available

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available

Special Remarks on Chronic Effects on Humans: Passes through placenta.

Special Remarks on other Toxic Effects on Humans:

Skin: May cause skin irritation, not expected to be a health hazard.

Eyes: Dust may cause mechanical eye irritation.

Inhalation: May cause respiratory tract irritation

Ingestion: Extremely large doses may cause GI tract disturbances.

Low hazard expected for usual laboratory handling.

SECTION 12: ECOLOGICAL INFORMATION



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Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation and the product itself are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

DOT Classification: Not a DOT controlled material (United States)

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

SECTION 15: REGULATORY INFORMATION

Federal and State Regulations: TSCA 8(b) inventory: Sucrose

Rhode Island: RTK hazardous substances

Pennsylvania: RTK Sucrose

Minnesota: RTK Sucrose

Massachusetts: RTK Sucrose

Tennessee: RTK Sucrose

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).



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DSCL (EEC):

This product is not classified according to EU regulations.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

SECTION 16: OTHER INFORMATION

References: Not available.

Other Special Considerations: Not available.

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